

REMARKS

Examiner Interview

The Applicants would like to thank the Examiner and the Primary Examiner for their time in conducting an Examiner Interview on June 19, 2009. Telephonically present at the interview were Adam Furst representing the Applicants, as well as Examiner William McCalister and Primary Examiner Stephen M. Hepperle. A proposed amendment to claim 1 was discussed, with the Examiners indicating that while the proposed amendment would overcome the art cited, a new search may be called for. No agreements were reached.

Claims 1-10 and 12-20 are pending in the application. Claims 1, 7, 12, and 17 have been amended. Favorable reconsideration of the application, as amended, is respectfully requested.

II. REJECTIONS OF CLAIMS 1-5, 7, 9, 10, 12-17, 19, 20 UNDER 35 U.S.C. § 102

Claims 1-5, 7, 9, 10, 12-17, 19, 20 stand rejected under 35 U.S.C. § 102 as being anticipated by Ollivier (US 6,450,200). The Applicant believes that all pending claims are allowable for at least the following reasons. Withdrawal of the rejection is respectfully requested.

As an initial matter, the Applicants wish to point out that, as noted in the Examiner's Response to Arguments at Paragraph 8 of the Final Office Action, the claims do not require fixation of the aperture after the shutting of the first valve. As an example, Applicants have stated in Amendment A that Ollivier teaches away from fixing the aperture of the flow control valve after the interruption of the flow of process gas. However, this statement was not meant to introduce any limitations into claim 1 or any of the independent or dependent claims. To further clarify this, claim 1 has been amended to state that "the aperture remains fixed at the selected aperture opening during the pressure change measurement." However, the claims DO NOT limit whether the aperture is fixed before or after the shutting of the first valve, and neither the claims nor the Applicants ever intended such an interpretation. Thus, the Applicants request that the Examiner evaluate the prior art without such a limitation.

Ollivier discloses a system to deliver process gas in batches. Once a batch of gas begins to be delivered, the flow of process gas from a gas source to a reference capacity (tank) is interrupted using valve 14. *See* Ollivier at Col. 5 Lines 63-65. The process gas is continually being delivered to the processing chamber at a controlled flow rate. *See* Ollivier at Col. 5 Lines

65-67. While this is happening the pressure drop in the reference capacity (tank) is measured. *See* Ollivier at Col. 5 Lines 61-62.

This measured pressure drop represents the actual flow rate, which is then compared to a desired flow rate to generate an error signal that can be used to adjust the flow rate for future batches of process gas. *See* Ollivier at Col. 6 Lines 1-9, and Lines 60-65. For testing, the desired flow value can be set as a percentage of the full batch of process gas (e.g., 50% of the process gas should be provided from the reference tank to the process chamber during the delivery period of time). *See* Ollivier at Col. 6 Lines 48-52. However, during the measurement of the actual flow rate – and actually at all other times as well – the flow rate is controlled by the flow control valve 22 to deliver process gas at a controlled rate.

Independent claim 1 has been amended to further clarify that in present invention, the flow control valve aperture is fixed at a selected opening during the pressure measurement. Independent claim 1, as amended, requires a flow control device having a deviation measurement/control component that “fixes an aperture of the flow control valve mechanism at a selected aperture opening and measures changes in the pressure using the pressure detector while the channel is closed by the first opening and closing valve wherein the aperture remains fixed at the selected aperture opening during the pressure change measurement ...” (emphasis added) This limitation is not taught or suggested anywhere in Ollivier. Ollivier does disclose measuring a pressure drop in a tank while the channel is closed, but Ollivier specifically does not teach or suggest fixing an aperture of the flow control valve mechanism at a selected aperture opening, since the flow rate in Ollivier is always controlled.

Claim 1 also requires calculating “the deviation from the standard level associated with the selected aperture opening based on the measured changes in the pressure.” This limitation is also not taught by Ollivier. Ollivier discloses comparing the actual flow rate (determined from the pressure measurements) to a desired flow rate (as set at some percentage of the process gas). In contrast, the “standard level” of claim 1 is not a desired flow rate, but an actual flow rate measured at a previous time. Thus, claim 1 compares two separate measurements of actual flow rates measured at different times, whereas Ollivies implements a control scheme by comparing actual to desired flow rates.

Thus, having several limitations not taught or suggested by Ollivier, claim 1 is allowable. Claims 2-5 are dependent on claim 1 adding further limitations, and are therefore also allowable. Independent claim 12 includes limitations substantially similar to allowable independent claim 1,

and is therefore also allowable. Claims 11-16 are dependent on claim 12 adding further limitations and are therefore also allowable. Independent claim 7 and 17, as amended, also contain limitations similar to independent claim 1. Therefore, claims 7, 17, and all claims dependent on these claims are also allowable.

III. REJECTIONS OF CLAIMS 2-5, 7, 9, 10, 12-17, 19 and 20 UNDER 35 U.S.C. § 103

Claims 2-5, 7, 9, 10, 12-17, 19 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ollivier in view of Wilmer (US 5,865,205). Applicant believes that all pending claims are allowable for at least the following reasons. Withdrawal of the rejection is respectfully requested.

The system described in Wilmer is similar to the system described in Ollivier in that Wilmer teaches releasing process gas from a chamber while closing off the gas source and dynamically controlling the flow of gas from the chamber as the process gas is released from the chamber to correspond to a desired regulated gas flow rate. *See* Discussion of Ollivier Above, and further *See* Wilmer at Col. 6 Lines 9-10, and Lines 27-31. Thus, Wilmer – like Ollivier – expressly teaches away from the limitations of independent claims 1, 7, 12, and 17.

The Office Action points to a section of Wilmer that discloses determining an initial positioning of a flow control valve based on calibration information in look-up tables. *See* Wilmer at Col. 8 Lines 24-32. The look-up tables include process gas-specific initial valve openings. *See* Wilmer at Col. 8 Lines 27-30. However, the flow control valve is still controlled during delivery of the process gas. *See* Wilmer at Col. 9 Lines 2-5. It is merely its initial position that is set. In contrast, claim 1 requires “fix[ing] an aperture of the flow control valve mechanism at a selected aperture opening, and measure[ing] changes in the pressure using the pressure detector while the channel is closed by the first opening and closing valve, wherein the aperture remains fixed at the selected aperture opening during the pressure change measurement.” (emphasis added) As in Ollivier, the flow control valve in Wilmer is not fixed during pressure measurement, it is only given an initial opening value to be changed during process gas delivery.

Furthermore, as in Ollivier, Wilmer compares actual gas mass to desired gas mass. *See* e.g., last block of Fig. 5. Thus, Wilmer also does not teach or suggest calculating “the deviation from the standard level associated with the selected aperture opening based on the measured changes in the pressure,” as required by claim 1.

Claims 2-5 are dependent on claim 1 adding further limitations. Since Wilmer does not teach or suggest – in fact expressly teaches away from – the limitations of claim 1, claim 1 and its dependent claims are all allowable over Ollivier in view of Wilmer.

Independent claim 12 includes limitations substantially similar to allowable independent claim 1, and is therefore also allowable. Claims 11-16 are dependent on claim 12 adding further limitations and are therefore also allowable. Independent claim 7 and 17, as amended, also contain limitations similar to independent claim 1. Therefore, claims 7, 17, and all claims dependent on these claims are also allowable.

As set forth in the remarks above, the Applicants believe that all claims currently pending are in condition for allowance, and should now be allowed. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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